

# Emily R. Duncanson, MD

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Cortney LeNeave

Hunegs, LeNeave & Kvas, PA

1000 Twelve Oaks Center Drive, Suite 101

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April 26, 2018

Dear Mr. LeNeave

I have reviewed the following materials provided regarding Jacob Tischer:

- Ambulance report
- Autopsy report
- Death certificate
- Mayo Clinic hospital records

Based upon this information, my understanding of the sequence of events involving Mr. Tischer is as follows:

8/12-13/2017: Mr. Tischer felt ill at work, complaining of headache and balance issues early on in the day (self reported in medical records). Per the medical records at approximately 20:30 while still at work he experienced paralysis of his left side. Ambulance was called at 21:00 with stated concerns of stroke symptoms. At Eau Claire a head CT showed an ischemic stroke in the right middle cerebral artery territory. "Ischemic" means the artery was blocked by a thrombus and a region of the brain was deprived of blood flow. (This is in contrast to a hemorrhagic stroke where a blood vessel ruptures into the brain.) At Eau Claire they felt they could not administer tissue plasminogen activator (TPA), which is known in lay terms as a "clot busting" drug, to try to break up the thrombus in the artery. He was transferred to St. Mary's in Rochester where he underwent an endovascular procedure to reopen the arteries in his brain. He was found to have a thrombus in the right internal carotid artery, anterior cerebral artery, middle cerebral artery and posterior cerebral artery.

8/14/2017: Mr. Tischer appeared to have some alteration in consciousness and was found to have hemorrhagic conversion of his ischemic stroke. He required a craniectomy (removal of part of the skull) to release the pressure from the hemorrhage. He improved after the craniectomy but continued to be paralyzed on one side of his body.

8/18-19/17: Coagulation studies came back normal. A positive d-dimer was noted which means there is a thrombus somewhere in the body. They are unsure if the stroke was caused by a thromboembolus (a blood clot that traveled from another part of the body) or an arterial dissection (a structural abnormality in an artery where blood pools in the arterial wall and narrows the arterial lumen.)

8/20/17: Mr. Tischer complains of leg pain in his paralyzed leg. A deep vein thrombosis is found. They cannot give him the preferred drug, warfarin, because of his brain hemorrhage. A filter is placed in his inferior vena cava (IVC filter) which is meant to catch any thrombi if they dislodge from the leg, to prevent them from moving into the lungs (pulmonary embolus).

8/22-23/17: A transesophageal echo is performed on Mr. Tischer's heart to evaluate for possible sources of thrombus that could have caused the stroke. A bubble study is done to see if there is a hole in the atrium of his heart. They do not see any communication at the atrial level, i.e. bubbles do not cross the atrial septum. They do find a vascular shunt in his lungs which is of questionable clinical significance. CT angiography of the chest is performed to follow up on this pulmonary shunt. The shunt is found to be very small and insignificant, but the CT shows asymptomatic pulmonary emboli (clots in the lungs).

8/26/17: Mr. Tischer dies suddenly in the PM&R unit. His significant autopsy findings are pulmonary emboli in the main pulmonary artery and left PA branch, and ischemic cerebral infarcts with hemorrhagic conversion. The cause of the stroke is concluded by the medical examiner to be a "paradoxical embolus" which is a clot that crosses through a hole in the heart and lodges in the arteries that supply the brain. A 4 mm patent foramen ovale (an opening in the atrial septum) was found in the atrial septum of Mr. Tischer's heart. They were not able to examine the right middle cerebral artery to rule out an arterial dissection, which was suspected clinically. The cause of death is listed as "Acute pulmonary thromboembolism due to large right cerebral infarct due to paradoxical thromboembolism with patent foramen ovale due to lower extremity deep vein thrombosis."

My opinion is that Mr. Tischer died from complications of ischemic stroke, and that a delay in seeking treatment contributed to the severity of his stroke and contributed to his death. The basis for my opinion is as follows:

1. The extent of a stroke and related impairment increases with the passage of time if it is left untreated. Flow must be restored to the brain as quickly as possible to mitigate tissue damage. Immediate treatment of a stroke can prevent long term disability or death. Delays cause ischemic injury to be increasingly irreversible, and also limit the options for stroke treatment. Had Mr. Tischer been brought to medical attention earlier in the day before he collapsed, when his symptoms were milder (balance issues and headache), more timely treatment could have prevented his hemiplegia (paralysis of one side). Had he presented earlier, TPA or "clot busting" intravenous medications could have been administered and could have prevented or lessened

his level of disability. TPA must be administered within a maximum of 4.5 hours of symptom onset. He was not given TPA at Eau Claire because the onset of symptoms was felt to be unclear.

2. The hemiparesis (paralysis on one side of body) was a risk factor for Mr. Tischer to develop a deep venous thrombosis (DVT) in his lower extremity or even his upper extremity, which is what led to his death from pulmonary embolus (PE) (a thrombus that travels from an extremity to the lungs). Although the DVT was discovered prior to his death, ideal treatment for it was precluded by the hemorrhagic conversion of his ischemic stroke, since anticoagulation is contraindicated in a bleeding patient. The underlying reason for the DVT in the first place is blood flow stasis in a paralyzed limb—from the stroke. It is not clear why the IVC filter did not prevent the PE—unless the thrombus came from the upper extremity, which was also paralyzed and was not checked for thrombus with an ultrasound or at autopsy.
3. The hemorrhagic conversion of the ischemic stroke may have been prevented or mitigated by earlier intervention, and treatment for the DVT could have been optimized.

If you have any questions about the opinion above, please do not hesitate to contact me via phone or email.

Sincerely,

Emily R. Duncanson, MD